

Contributors to This Issue

RAYMOND E. BARBER, B.S.E.E., 1967, University of Denver; M.S.E.E., 1970, North Carolina State University; Western Electric, 1967-1971. AT&TCo, 1971—. Mr. Barber was assigned to the Western Electric Service Division from 1967 to 1968. In 1968 he was transferred to Defense Activities, Greensboro, North Carolina, where he was "on loan" to Bell Laboratories, involved in precision frequency and time generation. In October 1970, he returned to the Western Electric Service Division, Aurora, Colorado. Currently he is with AT&TCo Long Lines Department, New York City. Member, Eta Kappa Nu, IEEE.

ANDREW H. BOBECK, B.S.E.E., 1948, and M.S.E.E., 1949, Purdue University; Bell Telephone Laboratories, 1949—. Mr. Bobeck's early work concerned the design of communication and pulse transformers and, later, the development of one of the first solid-state digital computers. Since 1956, he has specialized in the development of magnetic logic and memory devices. He was responsible for the conception and development of the twistor memory device. Most recently he has been investigating the properties of cylindrical domains found in uniaxial magnetic materials, such as the orthoferrites. Member, Tau Beta Pi, Eta Kappa Nu. Fellow, IEEE.

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DENIS J. CONNOR, B.A.Sc., 1963, M.A.Sc., 1965, and Ph.D., 1969, University of British Columbia; Bell Telephone Laboratories, 1969—. A member of the Opto-Electronics Research Department, Mr. Connor is currently working on techniques for the efficient coding of television signals by making use of both in-frame and frame-to-frame correlation.

EDWARD DELLA TORRE, B.E.E., 1954, Brooklyn Polytechnic Institute; M.S. (Electrical Engineering), 1956, Princeton University; M.S. (Physics), 1961, Rutgers University; D.E.Sc. (Electrical Engineering), 1964, Columbia University; Associate Professor, Rutgers University, 1956-1967; Bell Telephone Laboratories, 1967-1968; Associate Professor, McMaster University, 1968—. Mr. Della Torre's early interests were in magnetic recording. Since 1967, he has been interested in bubble devices. He is the author of *The Electromagnetic Field* with C. V. Longo. Member, Sigma Xi, Eta Kappa Nu. Senior Member, IEEE.

U. F. GIANOLA, B.S. (Physics), 1948, and Ph.D. (Electron Physics), 1951, University of Birmingham, England; Postdoctorate Fellow, Physics Department, University of British Columbia, 1951-1953; Bell Telephone Laboratories, 1953—. Mr. Gianola worked initially in the Communications Research Department where he was concerned with exploration of new techniques for communications devices. Later in the Components and Solid State Device Division, he supervised construction of prototype models of the permanent magnet twistor memory for stored program in ESS No. 1. In 1963 he became Head of the Fundamental Memory Components and was responsible for the exploratory development of advanced memory devices, including magnetic thin film and magnetic "bubble" domain memories. In 1969 he was appointed Head of the Ocean Physics Research Department, responsible for experimental and theoretical studies of ocean acoustics phenomena. Member, American Physical Society, Scientific Research Society of America. Fellow, IEEE.

BERNARD GLANCE, Dipl. Ing., 1958, Ecole Spéciale de Mécanique et Electricité; Dipl. Ing., 1960, Ecole Supérieure d'Electricité, Paris, France; C.S.F., Research Center of Corbeville, Orsay, France, 1960-1966; Dipl. Docteur (Ing.), 1964, Sorbonne, Paris; Bell Telephone Laboratories, 1968—. At C.S.F., Mr. Glance had been engaged in research on microwave tubes. At S.F.D. Laboratories, he had worked on high-power microwave amplifiers. Mr. Glance is presently working on microwave solid-state integrated circuits.

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HARRY HEFFES, B.E.E., 1962, City College of New York; M.E.E., 1964, and Ph.D., 1968, New York University; Bell Telephone Laboratories, 1962—. Mr. Heffes' interests have been in applications of modern control theory, filtering theory, and system modelling. An Adjunct Associate Professor of Electrical Engineering at New York University, Mr. Heffes is currently Supervisor in the Systems Analysis and Modelling Department. Member, Tau Beta Pi, Eta Kappa Nu.

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SHELDON HORING, B.E.E., 1957, City College of New York; M.E.E., 1959, New York University; Ph.D. (E.E.), 1962, Brooklyn Polytechnic Institute; Bell Telephone Laboratories, 1957-1960, 1962—. Mr. Horing completed the communications development training program in 1960. He was first engaged in the design and development of an optical electromechanical control system. After spending two years on the faculty at Brooklyn Polytechnic Institute, he returned to Bell Laboratories where he joined the Mathematical Analysis and Consulting Group. Since that time, he has been engaged in research and consulting in control theory and related areas, as well as in studies of defense systems and air traffic control. He is currently Head of the Systems Analysis and Modelling Department. Member, Sigma Xi, Tau Beta Pi, Eta Kappa Nu.

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HANS G. MATTES, B.S.E.E., 1964, California Institute of Technology; M.S.E.E., 1966, and Ph.D., 1968, University of Southern California; Bell Telephone Laboratories, 1968-1970. Mr. Mattes was engaged in the development of substrates for integrated electronics. Presently on a leave of absence, he is teaching at the National Taiwan University. Member, Sigma Xi.

JAMES E. MAZO, B.S., 1958, Massachusetts Institute of Technology; M.S., 1960, and Ph.D., 1963, Syracuse University; Research Associate, University of Indiana, 1963-64; Bell Telephone Laboratories, 1964—. Mr. Mazo was engaged in work on quantum scattering theory at Indiana University. Now he is doing theoretical analysis of data systems. Member, American Physical Society, Sigma Xi, IEEE.

SCOTTY R. NEAL, B.A. (Mathematics), 1961, M.A. (Mathematics), 1963, and Ph.D. (Mathematics), 1965, University of California, Riverside; Research Mathematician, Naval Weapons Center, China Lake, California, 1964-1967; Bell Telephone Laboratories, 1967—. Since coming to Bell Laboratories, Mr. Neal has been primarily concerned with the analysis of various aspects of telephone traffic systems. He has also worked on applications of optimal linear estimation theory and certain aspects of communication theory. Member, American Mathematical Society, SIAM, Sigma Xi.

PETER G. NEUMANN, A.B., 1954, and S.M., 1955, Harvard University; Dr. rerum naturum 1960, Technische Hochschule Darmstadt, West Germany; Ph.D. (Applied Mathematics), 1961, Harvard University; Bell Telephone Laboratories, 1960—; currently Visiting Mackay Lecturer, University of California at Berkeley (on leave from Bell Laboratories, 1970-71). Mr. Neumann has been engaged in research in computers and communications since 1955, including as special interests coding theory and computer operating systems. Member, ACM, Sigma Xi, Society of Harvard Engineers and Scientists, AAAS, IEEE.

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JOHN R. ROSENBERGER, B.S.E.E., 1966, University of Tennessee; M.S.E., 1967, University of Pennsylvania; Bell Telephone Laboratories, 1966—. Mr. Rosenberger has studied the problem of echo in the telephone network and the feasibility of employing self-adaptive echo cancellers to control echo. He has also worked in the area of filter design where he was concerned with developing an interactive filter design and analysis program. He is presently engaged in work on a portable computerized testing system for measuring transmission and performance characteristics of telephone circuits. Member, Tau Beta Pi, Eta Kappa Nu.

WILLIAM G. SCHOLES, A.A.Sc., 1968, Devry Institute of Technology; Bell Telephone Laboratories, 1968—. Mr. Scholes is in the Opto-Electronics Research Department. He is currently working on frame-to-frame and in-frame coding of television signals.

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EDMOND J. THOMAS, B.S.E.E., 1964, and M.S., 1965, Rensselaer Polytechnic Institute; Rutgers University, 1968; Bell Telephone Laboratories, 1965—. Mr. Thomas has been engaged in studying the applicability of various adaptive control systems to the echo-control problem. Most recently he has been involved in characterizing the performance of these systems in nonlinear and time-varying environments. Member, Tau Beta Pi, Eta Kappa Nu, Sigma Xi, IEEE.

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